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# The Automobile

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Mr. James Lanier. Mr. Alexander Fischer. Mr. W. K. Vanderbilt, Jr.

AUTOMOBILE RACES AT NEWPORT—GASOLINE VEHICLES LINED UP FOR THE FIRST HEAT.

## The Automobile Races at Newport.

By Spencer C. Crane.

To those who were fortunate enough to witness the automobile races in Newport on Sept. 6th it was apparent that Newport is destined to be the center of automobilism in its most pleasing form in this country. This is not to be wondered at when it is realized that around Newport is a perfect network of beautiful roads, shaded for miles by overhanging trees and surrounded on all sides by water.

The races were the outcome of friendly rivalry which existed between many members of the summer colony regarding the relative speed of their various machines. The only place where the contest could be decided was a half-mile track about three and a half miles outside of the city, which was in fair condition, but with very little banking at the curves.

This track was at once engaged and the races arranged. The moment the first arrangements were really under way all Newport seemed to go automobile mad, the result being the birth of The National Automobile Racing Association, comprised of W. K. Vanderbilt, Jr., president; Spencer C. Crane and F. W. Peckham, vice-presidents; Edward T. Hayward, treasurer, and George Baright, general manager.

As soon as the organization was completed the work was started in earnest, with the result that soon there were more contestants than could properly be handled in one afternoon. In the meantime cups had been donated by Mrs. Herman Oelrichs for the championship prize, Mrs. O. H. P. Belmont for the gasoline tricycle class, Mr. W. K. Vanderbilt, Jr., for the steam class, The New England Electric Vehicle Transportation Co. for the gasoline, and The Locomobile Co. of America for the electric class. Second place cups were offered by the racing association, bringing the number of cups to ten.

The races began promptly at two o'clock. The first race was won by Mrs. Herman Oelrichs by default, as Mr. Clarence Dolan at the last moment had withdrawn his machine, and Mr. Knight Neftel had not put in an appearance. The second race was the first heat of gasoline tricycles, the start of which proved very amusing to the crowd, who could not seem to understand why tricycles could not start themselves. The race was won by K. A. Skinner in 10 minutes and 30½ seconds; J. Boiselote second, time 40 minutes 30 seconds, Harold Vanderbilt not being timed.

The third race proved one of the most closely contested that has been seen on any track in this country, the contestants being The Riker Electric Vehicle Co., L. H. De Forrest and The New England Electric Vehicle Co. At the crack of the pistol Riker and the New England vehicles sprang ahead side by side, so close together that either could have stepped from one vehicle into the other. As the two leading contestants gradually increased their speed the Wood's machine operated by Mr. De Forrest was lost in the clouds of dust in the rear.

Lap after lap was reeled off without either contestant gaining ten feet, until the race developed into a see-saw match, the Riker machine forging slightly ahead on the stretch, only to be caught up with by the New England machine at their curves. Finally, when both machines tried to finish with the spurt, the New England machine failed to respond, which gave Riker the race by 7½ seconds.

The fourth race was between steam vehicles, the entries being The Locomobile Co., driven by Mr. S. T. Davis, and Mr. John Jacob Astor, which was won by Davis in 10 minutes 48½ seconds.

The fifth race, being the second heat for the tricycles qualified for the final. Mr. Charles S. Henshaw first, time 9 minutes 42 seconds; Mr. Royal Phelps Carroll second.

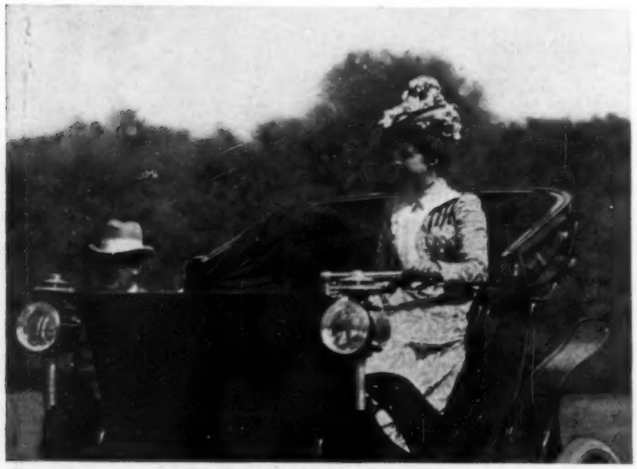
The sixth race being for steam vehicles, the entries being by The Mobile Co. of America, ridden by J. H. McDuffee, Mr. George I. Scott, time 14 minutes 16 seconds.

The seventh was for gasoline vehicles qualified for final. Mr. W. K. Vanderbilt, Jr., first, time 8 minutes 58½ seconds; Alexander Fisher second, time 13 minutes 3½ seconds.

The eighth was for electric vehicles, final heat, between Mr. A. L. Riker and Mrs. Herman Oelrichs. Mr. A. L. Riker first, time 13 minutes 5 seconds; Mrs. Oelrichs second.

It is most interesting to note that the vehicle entered by Mrs. Oelrichs was the ordinary commercial runabout, fitted up with but a short-distance battery and converted into a high-speed machine through the ingenuity of Mr. Cooper Hewitt. The time made by this machine in its first laps was most astonishing, and proved to those familiar with racing machines that a successful track racer should be built on light lines, with a short wheel base, and provided with a battery that is capable of forcing the machine to its utmost for a distance of not over five miles, as it was clearly demonstrated at the Newport races that anything over five miles would have become monotonous.

The ninth race was won by Mr. De Wolfe Bishop by default, the other gasoline machines entered for this heat failing to appear.



MRS. HERMAN OELRICHS, DONOR OF THE CHAMPIONSHIP CUP, IN HER ELECTRIC CARRIAGE, WATCHING THE RACES.

MR. JOHN JACOB ASTOR IN HIS LOCOMOBILE WAITING FOR THE FOURTH RACE.

THE AUTOMOBILE RACES AT NEWPORT.

The tenth race was the final for the steam, and was won by a mobile operated by Mr. McDuffee, time 10 minutes 42 seconds, the locomobile breaking down at the start.

The eleventh was a final for gasoline, which brought two rival machines together. Vanderbilt made a false start before the pistol was fired, but instantly corrected the mistake, and a beautiful start was the result. It was soon evident that Vanderbilt's machine was the superior, as it forged steadily ahead, and won in 8 minutes 53½ seconds, Bishop finishing in 9 minutes and 30 seconds.

The twelfth race was the final between Skinner and Henshaw for the tricycles, being won by Skinner in 9 minutes 12 seconds.

The last or mixed race was made up from the winners of the electric, steam, gasoline and tricycle heats, which when lined up for the start formed a most interesting picture.

Mr. Vanderbilt's gasoline machine at the start was emitting sundry roars and chatterings, which terminated in the vehicle springing forward at incredible speed, and though the last to start, passed the tricycle and the steam machine. Around the track he flew, but go as he would the innocent looking electric held its own to an inch for several laps. Vanderbilt gradually drew closer to the electric, and finally passed it. As he was passing an extra switch was thrown in on the electric, which melted a lug and proved fatal to its chances of winning. Vanderbilt now threw his machine into a still faster gear, and flew around the track in a manner that was truly marvelous.

Those who were fortunate enough to be at the corners had a rare picture of clever work. Vanderbilt was bending low over the steering wheel, with both hands close together holding the steering wheel, his French chaffeur greatly assisting him on the curves by leaning out as far over the track as his long arms would permit him, notwithstanding the fact that the slightest movement of the steering gear would have resulted in a slue which would undoubtedly have proved fatal. It was a rare combination of confidence of the servant in the master, and stamped Vanderbilt as a cool, clear-headed driver.

The race gave Mr. Vanderbilt the championship of America until the races which will be held next year, when he must again defend his laurels.

Time made by Mr. Vanderbilt was 8 minutes 54 seconds. Mr. A. K. Skinner, with his tricycle, came in second in the excellent time of 9 minutes 22 seconds. The electric machine which broke down came in third.

The greatest day in the history of the automobile was brought to a close by this magnificent race, and again the procession of all manner of vehicles wound its dusty way toward the cool, shady trees of Newport.

## Hints on Steam Vehicle Management.—I.

By George T. Hanchett.

The steam vehicle is one of the simplest of self-propelled vehicles, but it may also be truthfully said that of all vehicles it requires the most intelligent care to keep it in good condition, because the accidents which may overtake it are in some cases of such a peculiarly fatal nature.

The boiler or fount of power of the vehicle is by no means as simple an apparatus as the ordinary household teakettle. It usually consists of a cylinder set vertically and containing a multitude of small tubes not larger round than a lead pencil. These tubes run parallel with the cylindrical shell and are firmly beaded into each head and through them the flame passes. As the pressure carried in automobile boilers sometimes runs up to 200 pounds, this flame is of on mean heating power, and if in the early part of its course it encounters surfaces which are unprotected by water, the tubes will be burned and a ruined boiler will result.

There are two ways in which the heating surfaces of the boiler will be left at the mercy of the flames, one very obvious one being that of keeping insufficient water in the boiler. This is doubly dangerous, for, besides exposing surfaces to the fury of the flame, the small volume of water left in the boiler is vaporized with exceeding rapidity and may raise the pressure to dangerous figures. It therefore is highly important to look out for low water. The gauge glass must be frequently consulted to see that the level is right. Better than the gauge glass are try cocks; that is to say, little stop cocks screwed in the boiler, one at the high water line, one at the normal line and one at the low water line. On opening one of these it will be perfectly obvious whether steam or water is escaping, and thereby the water line will be reliably determined. Gauge glasses are not to be relied upon absolutely. They may become stopped or in some cases the valve connecting the gauge glass with the boiler may be shut off: The writer has seen cases where an operator has complacently surveyed a gauge glass which was entirely shut off from the boiler, because previously the gauge glass had been broken and the outlets were shut off to prevent the escape of steam. When the new gauge glass was put in the operator forgot to turn the stop cocks on again. Slight leakage and condensation filled the glass, and this led the operator to allow his boiler to become seriously damaged.

The second and much to be dreaded means by which boiler plates may become exposed to the heat is scale. This is one of the most serious troubles that beset an automobile boiler. An automobile boiler, weight considered, evaporates possibly more than any other boiler, not even barring the locomotive boiler, and if the water which is placed in the boiler contains any solid material, it is perfectly evident that that solid material will be left in the boiler and will accumulate in the mass of tubes in a most inaccessible position and cling to them so tightly as to keep the water away from them and allow the flame to do destructive work. The most innocent and limpid looking waters may contain large amounts of calcarious salts of magnesia and lime. This will not be apparent on looking at the water, because the water is apt to be slightly charged with carbonic acid, which renders this salt soluble.

The moment the heat is applied the carbonic acid is driven off and the salt is precipitated as a soft sludge which, if allowed to come in contact with hard surfaces, will bake on as a hard scale. It is idle to think of or attempt to use any of the boiler scale preventatives which will suit all conditions. There are boiler scale preventatives which are very efficient and by their introduction into the boiler unite with the foreign material forming a flocculent precipitate which holds the material in suspension in the water and does not allow it to bake on the tubes. Other materials may unite with the salt and render it soluble. Still others may be added to the water before it enters the boiler and precipitate the material, after which the clear liquid on the top is drained off, but it is perfectly evident that any boiler compound is applicable only in special cases. A scale preventative which will act admirably in the case of water charged with sulphate of lime may not answer at all if the water happens to be charged with a salt of magnesia. As an automobile boiler takes all kinds of water, according to where it may be, it is plain that no one scale preventative will answer, and in a water of unknown quality a proper compound could not be determined without chemical analysis.

It therefore behooves an automobile user to carefully select water for the boiler with a view to avoiding foreign material. Muddy water is, of course, out of the question. The foreign material in it can be seen and avoided. It should not be used under any stress of circumstances, for a few miles run with such feed water might cause a boiler to be burned out. It is obvious not a part of wisdom to substitute for a temporary stoppage on account of lack of clear water a more or less permanent one due to a burnt out boiler. It pays to be careful.

Well water should be particularly avoided. However clear it may be, it is almost certain to contain salts in solution which will be in evidence later. The best thing to use is rain water. If it contains sticks and vegetable material, as is sometimes the case, it may be strained through a cloth, but it is not likely to contain salts in solution. Next to rain water, running brook water or river water is desirable, but anything else should be avoided.

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The next exhibition of automobiles under the auspices of the club of Great Britain is announced. It is to be held at the Agricultural Hall from May 4 to May 11, 1901. The dates are advantageous, and the show will no doubt be a greater success than the one recently held this year.

# NEW STYLES OF AUTOMOBILES

### The Kensington Electric Runabout.

The runabout illustrated in Fig. 1 is one of the latest products of the Kensington Automobile Manufacturing Co., Buffalo, N. Y. It is equipped with a single reduction motor. The wheels are of wood, fitted with 1½-in. solid tires, the front wheels being 32 ins., the rear 36 ins. The maximum speed is 15 miles an hour. The carriage is equipped with a battery of 40 cells, and its makers claim that it is capable of running 35 miles on one charge. The total weight of the vehicle is 1,800 pounds.

### The Orient Victoriette.

The victoriette, illustrated in Fig. 2, has just been brought out by the Waltham Manufacturing Co., Waltham, Mass. The motive power is ingeniously concealed without giving a clumsy appearance to the carriage. The body is low and easy of access, and is balanced on elliptical springs. It has a double seat with a substantial covered top, and in place of the usual dash is a single auxiliary seat. The running gears are painted bright, while the body is highly polished. The wheels are 28 in., heavily spoked with clincher rims fitted with 2½-in. tires. The motor is of the Aster water-cooled gasoline type located beneath the body, and is communicated with the rear axle by a sprocket and chain. The water-radiating reservoir is located under the forward seat. A crank movement convenient to the operator's seat starts the motor, and the power is applied by means of a strong clutch, also within the carriage. Two speed gears are employed; the high for level and fast riding, the low for hill climbing and slower pace. A powerful band brake applied by the foot operates on a drum on rear axle. At the steering wheel is the shut-off, which, by a turn of the hand, suspends the power, and then running on acquired momentum, the carriage can be brought to a standstill by the application of the brake.

### Automobile Co. of America's Phaeton.

In Fig. 3 is illustrated the standard Stanhope phaeton manufactured by the Automobile Co. of America, Marion, N. J. Several recent improvements have been made. The vehicle is equipped with a three cylinder, balanced gasoline motor of 10 horse-power, and the starting is managed from the seat. It is capable of climbing a 20 per cent. grade, and is practically noiseless and free from vibration. All bearings are self-lubricating, no oil cups being used. A speed ranging from a minimum to 25 miles an hour can be obtained. It has fuel carrying capacity which admits of a run of 100 miles by one filling of the gasoline tank. The aim of the builders has been to make the vehicle simple and economical in operation. It is constructed on the interchangeable plan.

### The Packard Special.

In Fig. 4 is shown the latest product of the automobile department of the New York & Ohio Co., Warren, O. The appearance and general design are practically the same as the company's standard carriage, but is more powerful and adapted for higher speeds.

A single cylinder gasoline engine, which will indicate twelve horse-power on the brake at its maximum normal speed of 800 r. p. m. is used. Four speeds ahead are provided, varying from 6 to 30 or more miles per hour, and two speeds backward are obtained. The speed in running is controlled by throttling the engine. The sparking is of the high-tension type, and is automatically controlled, a sensitive automatic governor adjusting the spark. The carriage is fitted with the company's new rim brakes, in which an auxiliary brake rim is fitted on the inside of the rims of the rear wheels, and large brakeshoes are applied to this rim, thus providing a durable and safe arrangement, so that if the rear axle differentials and the chain should give way, an efficient brake would still be left. The usual band brake on the forward counter shaft is provided, and this is operated with a single hand-controlling lever. The rim brakes are operated with an auxiliary foot lever. Wheel steering is possible and the makers consider this essential for a high speed machine running over twenty miles an hour. The bearings and oil cups are supplied with oil from a reservoir, the capacity of which is sufficient for a run of from 150 to 200 miles. Double sets of batteries are provided for the electric ignition apparatus. The machine is provided with a detachable Dos-a-dos seat, thus having a carrying capacity of four or five passengers. The wheels are 36-in., and are provided with 4-in. pneumatic tires. The frame is ball-jointed throughout and is therefore extremely flexible, being designed to stand a high speed on rough roads. The machine is more powerful and speedy than would be required for general use, but the makers believe that there is a growing demand for such machines from experts.

### The Riker "Piano Box" Runabout.

The illustration on the opposite page, Figure 5, shows the "piano box" runabout, manufactured by The Riker Motor Vehicle Co., Elizabethport, New Jersey. The guaranteed distance over which the vehicle can travel is 30 miles on each complete charge of the batteries on level hard roads. The speed is 14 miles per hour. It has a double motor equipment and 40 cells of battery. The battery has a capacity of 50 ampere hours. As will be noticed, the wheel base is especially long, which tends to make the carriage easy riding. The weight complete is 1,300 pounds.

### The Pierce Electric Delivery Wagon.

The engraving, Fig. 6, shows an electric delivery wagon manufactured by Dr. R. V. Pierce and Dr. V. Mott Pierce, Buffalo. The vehicle is built particularly strong and heavy, and is designed especially for newspaper delivery work. It is equipped with chloride accumulators. The vehicle is fitted with two 4-HP. motors, with three speeds forward and two backward, built by the American Engine Co., of Bound Brook, N. J. It is handsomely finished throughout.

### An Interesting Trip from New York to Utica.

Mr. J. Dunbar Wright, a leading member of the Automobile Club of America and one of the best known automobilists, recently sent Mr. A. W. Chamberlin, of New York, the following account of a trip from New York to Utica:

"We left New York, 66th street, Friday, July 30. The first run was to Peekskill, 58 miles. Aug. 4, Peekskill to Hudson, 81 miles. There is a fearful hill between Peekskill and Garrison and in many places bad roads. Aug. 5, Hudson to Amsterdam, 69 miles. The roads very bad. Aug. 6, Amsterdam to Utica, 74 miles; a total of 282 miles.

The entire trip was made without an accident or machine giving out in any particular. My machine is a nine-horse-power Winton. The power is gasoline, consuming about five gallons for every 100 miles. I consider for the amount of gasoline used we could have done 500 miles in the same number of hours on roads such as they have in France or England, and I doubt very much if any foreign machine would have stood the wear and tear of the 282 miles between here and New York, and made on an average twelve miles an hour over the hills and through sand and rocks such as I found in several places. My engine develops nine horse-power and on down grade, of course, I can speed as high as 25 to 28 miles an hour, but this is dangerous over bad roads and rocks such as one finds between Albany and Utica."

The newspaper (daily) notices in regard to the English 1,000-mile trial, which are in the scrap-books of the Automobile Club, measure 504 feet in length.

It is reported that over 2,000 automobilists have already joined the new "Union of German Automobilists." A large number of German clubs will also join at an early date, which will be very beneficial for the automobile industry of Germany.

FIG. 1.—KENSINGTON ELECTRIC RUNABOUT.

FIG. 2.—ORIENT VICTORIETTE.

FIG. 3.—AUTOMOBILE CO. OF AMERICA'S PHAETON.

FIG. 4.—PACKARD SPECIAL.

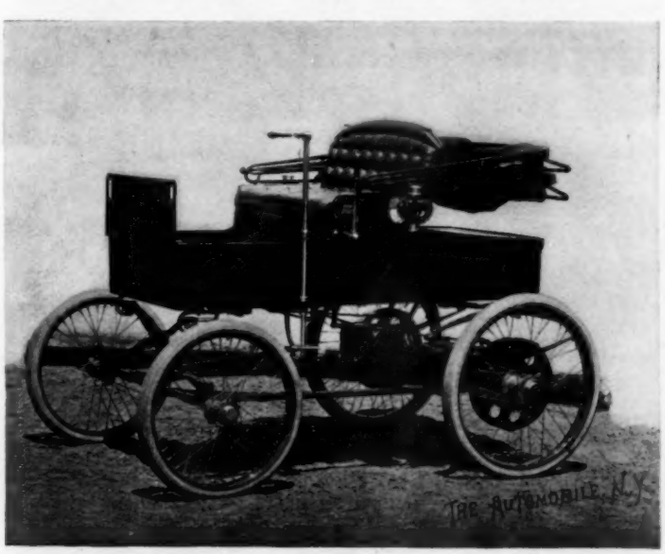


FIG. 5.—RIKER PIANO-BOX RUNABOUT.

FIG. 6.—PIERCE ELECTRIC DELIVERY WAGON.

## NEW STYLES OF AUTOMOBILES.

## Notes on the Care and Management of the Storage Battery.

By Max Loewenthal, E. E.

It is not an infrequent occurrence, in listening to an argument as to the relative merits of the various types of automobiles, to hear the owner of an electric vehicle claim that it is superior in every way to those propelled by any other power, adding, however, that his storage battery is a source of great annoyance, cost and inconvenience. To him we may briefly say, that this charge is entirely unwarranted, that the trouble lies largely with himself and not the battery, and if he would bestow upon that vital organ of his vehicle the same care that he would upon the horse which formerly propelled his carriage, his troubles would soon be at an end.

In fact, there exists so close an analogy between the treatment required by the horse and the battery that the writer has been led to compile the following set of rules and regulations which are equally applicable to either:

1. Be careful in their selection.
2. Study their anatomy.
3. Acquaint yourself with the causes of their ailments and know how to apply the cure.
4. Learn to feed them properly.
5. See that they receive the requisite amount of water.
6. Do not overfeed or underfeed them.
7. Do not overwork them.
8. Give them daily exercise, and do not permit them to stand idle for too long a period.
9. Keep them clean.
10. See that they get a chance to recuperate after violent exercise.
11. Do not overheat them.
12. House them properly.
13. See that their connections with the vehicle are bright and tight.
14. Injury to any part will destroy the efficiency of the whole, therefore cure the ailing element.

If the above few suggestions were made to the owner of a horse, no further qualifications would be necessary, but to the owner of a storage battery their significance may not be so self-evident or appear of equal importance. Let us, therefore, take up each section by itself and briefly explain its significance:

1. The purchaser of a battery should see that the type of cells with which he is going to equip his vehicle has stood the test of time and has proved itself capable of meeting the severe requirements of automobile service. He should be guided not only by catalogue figures, but by actual data collected by a user or some competent engineer. The recuperative power, small weight and space for a given output, and the durability of the cell should be carefully investigated by the purchaser. Many of the latter spend too little money on the lead batteries to propel their vehicle and too much on the lead paint to make them look handsome.

2. It is essential to study every detail of the battery's makeup. Know what its successful action depends upon and of what materials it is composed. In other words, acquaint yourself with the healthy condition of your cell.

3. You will then have less difficulty in detecting the symptoms of its ailments and learning how to apply the proper remedy. Among these the following might be mentioned: Should the plates become attacked and rot, the solution, called the electrolyte, is probably too strong, and it should be reduced to a specific gravity of 1,200, or 25° Baume, at a temperature of 60° F., and be frequently tested with a battery hydrometer. For weakening the solution, perfectly clear water only should be used. Soon after the solution is prepared, or after the cells have been charged, the specific gravity will probably be higher than 1,200, but will gradually fall to this value as soon as the liquid has cooled. Too strong a solution will also cause "sulphating," which may be detected by a salty deposit on the plates. Urquart's remedy for this is as follows: To a quart of strong solution of common washing soda add slowly, during agitation, 12 oz. of concentrated sulphuric acid. This should be added to the electrolyte in the proportion of 1:25. When diluting the solution the acid must be poured into the water, not the water into the acid, the proportions of acid (of 1840 spec. grav.) and water being one part of acid to five of water. Be sure that the electrolyte always covers the plates by about half an inch, and is poured in after it has cooled. Sulphating may also be remedied by charging the cell for a long time at a low rate. If the sulphating has proceeded to such an extent that none of the above remedies will destroy the coating, it is then necessary to take the plates out carefully, scrub them with a brush dipped in cold water, clean the jar and renew the electrolyte. When the charging current is too large, the plates are liable to "buckle," which in time will cause them to come together and produce a short circuit. In regard to this ailment, and all of them in fact, it is well to remind the user that an ounce of prevention is better than a pound of cure. Frequent and careful inspection of plates and electrolyte is, therefore, very essential.

4. Learn how to feed the battery. Upon this knowledge depends more than upon anything else the life of the battery. First of all be sure that the positive pole of the charging source is connected with the positive (dark) end of the battery and the same for the negative poles. Always charge the battery promptly after it has been used. The charging voltage should be higher than 2.2 volts multiplied by the number of cells at the beginning of the charge, and 2.5 multipled by the number of cells towards the end. This should not be guessed at, but be measured by an accurately calibrated voltmeter. A battery should not be rapidly charged unless it be completely discharged, and even then the current should be gradually decreased as the charge progresses. All the data relating to this should be obtained from the manufacturer, and the current should be accurately measured by an ammeter, and under no circumstances be guessed at. The boiling of the solution and the voltage of each cell being about 2.5 or 2.6, are indications of a completed charge. While charging cells inside of the vehicle it is well to have the door of the battery compartment open, as inflammable hydrogen gas is given off during the charge. Always be sure that the circuit is protected by a fuse, which is rated a little higher than the maximum charging current you intend to use.

5. The dilution of the electrolyte has been referred to in Section 1.

6. Not to overfeed the cells nor to underfeed them has also been alluded to. Too great and too small a charge are equally detrimental to the life of the cells.

7. Not to overwork the battery is very essential. The discharge rate should be limited to the maximum quoted by the manufacturer, and the charge should never be entirely taken out of the battery.

8. A battery should not be left standing idle for too long a time, but frequent charge and discharge improve it and prolong its life.

9. If at the end of the charge each cell does not show a voltage of 2.5 or more, and if no gas is given off, then foreign matter or scale may be looked for between the plates. If such are found, push them down to the bottom, but do not use metal for this purpose. It is also a good plan to occasionally clean the plates, as explained above, to renew the electrolyte and clean out the jar.

10. After the cells have been rapidly discharged it is wise to give them a chance to recuperate, and it will be found that the voltage will frequently increase considerably after a short period of rest.

11. The overheating of the cells due to too large a charge or discharge or pouring in too hot a solution will cause buckling and expansion of the plates, and will loosen the brownish, active material in the positive plates. These plates, in fact, are the ones which give most of the trouble, and should be carefully watched.

12. The battery should be housed in a compartment lined preferably with sheet lead, the plates should be set in acid-proof and watertight hard-rubber jars, a few inches higher than the plates themselves, and the cells should be firmly held in place so as to prevent the spilling of the solution.

13. It is most essential to keep the connections between the various cells, groups of cells, and cells and controller perfectly clean and tight. They should be undone at intervals, sandpapered or scraped, and screwed up tightly. A loose contact is frequently blamed for the unsatisfactory per-

formance of a cell. You certainly would not expect all the water you pour into a pipe having a hole in it to be discharged at the other end. The two cases are analogous.

14. It is a good plan to test the voltage of each cell from time to time, and if it is found that any cell does not retain its charge, or is otherwise disabled, it should be taken out of the circuit at once, and be repaired or replaced. One disabled cell out of an entire set of 40 or 44 cells is liable to play havoc with the remaining ones.

In closing these notes of warning the writer wishes to say that if you want to be the doctor you must understand your patient. Do not guess at anything, but rely upon accurate measurements, and for this purpose equip your plant with the necessary ammeter, high and low reading voltmeters and hydrometer, and remember that their combined cost is smaller than frequent repairs to your battery, the cost of an entirely new set or the occasional hauling home of your vehicle by some obliging farmhand.

## The Gasoline Vehicle Engine.*—III.

By E. W. Roberts, M. E.

Before discussing the operation of the various gasoline attachments and the difficulties to be encountered in their use, it is necessary to explain briefly the nature of the fuel, and to tell something about the manner in which it is derived from petroleum.

The first process in refining petroleum, is selective distillation, during which the petroleum is passed through various stills at different temperatures, the temperature of the petroleum being increased at intervals during the process. At the lowest temperature, gases are given off, which remain as such at the ordinary temperatures of the atmosphere. Then, as the temperature is increased, petroleum, ether, benzine, C naphtha, B naphtha, A naphtha, illuminating oil (kerosene), lubricating oils, paraffine wax, tar and coke come off in the order named. They are the so-called naphthas that are of special interest to the gasoline engine user. C naphtha ranging in density from 70° to 68° Baume, is that which is used on a gasoline engine, the common densities for the purpose being 76° to 74°, the latter being what is known as stove gasoline.

Each of these petroleum products may be further subdivided by selective distillation, into substances having different densities. In fact, the ordinary gasoline of commerce is in reality a mixture of various hydrocarbons of different densities, the average density of the mixture being that at which the gasoline is rated. It is this circumstance that is the cause of nearly all the troubles with carbureters, as it is the tendency of the lighter products contained in the mixture to evaporate before the heavier products. Take for instance the evaporation of gasoline in a filtering carbureter as illustrated in Fig. 3, part II. The air passes through the gasoline and takes with it first the lighter hydrocarbons, and in order to get the proper mixture in the engine, but very little air must be passed through the tank just after it has been filled.

As evaporation proceeds, the lighter products are carried away and the density of the liquid increases, so that it is necessary to either increase the volume of the air passing through the mixture or to increase its temperature by some convenient means, as, for instance, passing a portion of the exhaust through a pipe which goes through the body of the liquid. Finally there is left in the bottom of the tank a liquid which cannot be evaporated without heating it intensely, and beyond the capacity of the auxiliary exhaust pipe. It is necessary, therefore, to draw off this heavier hydrocarbon, which must be thrown away, and is so much fuel wasted.

This form of carbureter must always contain a piece of gauze, as shown at g in the figure or its equivalent, to catch tiny drops of liquid gasoline which are held in suspension by the air. It is necessary to get rid of these drops in order to obtain an even mixture in the engine. The carbureter shown in Fig. 4, Part II., is said by some to be a better form than that in Fig. 3, for the reason that it will evaporate the heavier hydrocarbons much better than the filtering carbureter, and leave but little waste material in the bottom of the tank. Another difficulty with the carbureter is that the evaporation of the liquid has a refrigerating action which tends to lower the temperature of the gasoline, and to decrease the rate of evaporation. At times this causes what is known as "freezing" of the carbureter, meaning that it gets so cold that the air will pass through it without carrying off any vapor. This trouble is usually experienced in cold weather and it may be obviated by warming the tank of the carbureter.

For those operators who use an engine having a carbureter, the following hints may be of service. It is, as a rule, much better to warm the liquid than to heat the air before it passes over the fuel. When hot air is drawn into the engine it reduces the amount of power which may be derived from it and increases the liability to premature explosions commonly known as "back-firing." When about to start on a long trip drain the carbureter and fill it with fresh gasoline. Thoroughly clean any gauze or filter at frequent intervals by washing in fresh gasoline. Observation alone will indicate how often this should be done.

The carbureter has a decided advantage over the vaporizer in two particulars. It gives a more thorough mixture than the latter, and is better for small engines, as there are no minute passages to be clogged up by foreign matter. These advantages, however, are fully counterbalanced by its sensitiveness to change in temperature and density of the fuel and to its wastefulness of fuel.

Of the vaporizers, all three of the types shown in Part II. are giving good satisfaction, although if there is any advantage it lies with the style shown in Fig. 5, as with this style there is no tendency to flood the air induction pipe, because the gasoline is drawn in by the inductive action of the air and does not depend upon the minute adjustment of the needle valve. In justice to the other styles, the writer may say that he has used them both with excellent results, and with intelligent handling he has found very little trouble with them. Much better results may be obtained with those in Figs. 6 and 7 if the air is slightly warmed before passing by the gasoline. It is hardly practical to warm the gasoline in this case, although it has been done with success by some operators.

The advantages of the vaporizer are that it uses up every particle of the gasoline, and its action is very little affected by changes in the temperature or the density of the fuel. It has, however, very small gasoline passages, which occasionally get clogged up, and for this reason every particle of gasoline that goes into the supply tank for a vaporizer should be carefully strained either through a fine sieve or a piece of muslin. Many operators use for this purpose an ordinary handkerchief, as the gasoline immediately evaporates and leaves very little odor.

Before starting an engine having a vaporizer, and when the weather is very cold, it is an excellent plan to heat the cylinder before starting up. If it is an air-cooled engine this may be done by the direct application of a flame from a torch on the outside of the cylinder. If it is a water-cooled engine the cylinder may be heated by filling the water tank and jacket with hot water. It would also help matters considerably if hot water would be poured over the vaporizer.

Even with the vaporizer there is a slight tendency for heavier hydrocarbon to deposit in the bottom of the fuel reservoir, and the tank should be occasionally drained and thoroughly cleaned. Dirty gasoline pipes may be washed out with ordinary soap and warm water, after which they should be given a final rinsing with gasoline.

For the smaller motor cycle engines, it appears that the carbureter is much more convenient and possibly easier to handle. When the engine reaches five horse-power and above, the writer's experience would favor the use of the vaporizer for no other reason than its economy of fuel. Carbureters, however, do unquestionably give the most homogeneous mixture of fuel and air.

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Messrs. Siemens & Halske have recently taken over the entire train and omnibus traffic of Vienna, and will soon do away entirely with the horse. The first electric omnibus made its appearance on June 14.

# The Automobile

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## Our First Anniversary.

It is with a feeling of gratitude to our readers, advertisers, and all who have aided by their advice, suggestion, and good will in the publication of THE AUTOMOBILE, that we enter upon our second year. Many important and significant changes have taken place in the industry, and wonderful progress has been made, especially in this country. It has been our aim to impartially record the current events, at no time favoring either a certain manufacturer or type of vehicle, and to present to our readers in an acceptable manner a monthly collection of reliable, condensed, and interesting data covering the entire field, in the preparation of which neither time, labor, or expense has been spared. During the year articles from many of the best known authorities in their special lines have been written for these pages, covering the design, construction, management, and care of vehicles, graphically illustrated. THE AUTOMOBILE is in a sense a newspaper, a magazine, and a text book, fulfilling in many respects the qualifications of each. Our correspondence columns have been freely used, and discussions have been opened up which could not help but be of mutual interest to both users and manufacturers. The constant growth of the subscription list and the patronage accorded by advertisers have been especially gratifying. In this allusion to ourselves we take the opportunity to thank our patrons, and assure them that the same impartiality of recording events and progress, the manner of treatment of same, and the protection of the rights and privileges of automobilists will continue, as in the past, to be our aim and policy.

## An Automobile Users' Protective Association.

Like all other important innovations, it is to be expected that the automobile and its devotees must be regarded with strong prejudice by the public. Numerous cases are in evidence wherever the self-propelled vehicle has come into use. As the public becomes accustomed to the new method of travel no doubt this prejudice will tend to wear away, but not until many innocent persons have been made to suffer.

It is, of course, true that instances of reckless driving and foolhardiness are on record, and such should suffer the penalty. Automobile users, however, have certain rights, and are entitled to every legitimate protection in the exercise of them. To obtain protection the public must be educated and legislation effected to secure common rights and privileges.

In England the Motor Vehicle Users' Defense Association has been organized, and good results are already apparent. Is not the time ripe for a similar organization in the United States? The various clubs already organized have done and are doing most excellent work toward educating the public. It would seem to us, however, that an affiliation of the various clubs and their members into a national protective association or league would be far reaching in the advancement of the cause of automobilism in this country. A nominal membership fee would be sufficient to cover the current expenses and the organization would be mutual in every sense. We have interviewed a number of the most prominent automobile owners and users, and without exception they have expressed themselves as being heartily in favor of the plan, and have assured us of their earnest co-operation. Why not organize such a league or association at once?

## Care and Management.

Of such importance do we consider the care and handling of automobiles that a considerable portion of this issue is devoted to the subject. We refer particularly to the three articles on the care and management respectively of steam, electric, and gasoline vehicles, written by men especially qualified to treat their subjects from a practical standpoint. A careful perusal of these articles, we believe, will be found time well spent. Were we to attempt to construct a composite sentence covering their contents it might read something like this: "Be careful in making your selection of vehicle to suit the service required; know the composition of your fuel and govern the fuel supply; keep all parts of the vehicle clean; inspect them before starting out and before returning; understand the operation and use of every detail of the mechanism, and do not trust anything to luck." It all means that a little neglect may cause much mischief, and that an ounce of prevention is better than a pound of cure. It is never too late to learn, and we would advise those operators whose vehicles have given them more trouble than delight to return once more to their student days and thoroughly inform themselves through treatises and the current literature published on their particular type of automobile. Time and money thus spent is a good investment. Complete safety can only be secured through perfect knowledge of how to handle the automobile.

## Danger of Too Many Exhibitions.

The automobile industry is frequently referred to as being in its infancy, and the pride felt in that healthy infant may to a certain degree explain the anxiety to "show it off." Recently, however, there seems to have developed an over-anxiety on the part of certain promoters to bring the progress of the industry prominently before the public eye, and they are, consciously or unconsciously, imposing upon the good nature of many industrial concerns. We refer to the large number of so-called automobile shows, meets and fairs which are being organized all over the country. We do not oppose legitimate and representative exhibitions of automobile products or the holding of meets to test the various qualities of the vehicles,

for, on the contrary, we believe them to be to the best interests of the industry, but much saving would be effected if discretion were displayed by the promoters in arranging their shows with due regard to the events already scheduled and the best interests of the manufacturers. Let us remind the promoters that representation at these numerous shows means a considerable expenditure to the manufacturer who wishes, and is almost forced by the pressure which is brought to bear, as well as intense competition, to exhibit his products. This same money expended for space, salaries to attendants, express and damage incurred, might well be spent on improvements to the vehicle and increasing manufacturing facilities. Some may argue that these expenses are overbalanced by the sales effected at these shows, and to those we would say that it seems possible that, if, for example, one large show were held in New York or one in a New Jersey town, instead of two or three in small towns a few miles apart and in the same month, the interested prospective buyer would have ample opportunity to view the progress of the industry and make his choice. What is needed is cooperation on the part of promoters and clubs, and the sooner this is brought about the sooner will they earn for themselves the thanks of the manufacturers and facilitate the progress of the industry.

### The Automobile and the Farmer.

In view of the large percentage of population which the farming community constitutes and the vastness of their resources and variety of interests, according to the late census, it is not surprising to find so many industries developing one or more of its branches in such a direction as to have it appeal particularly to the farmer. Upon investigation it is found that the automobile industry is now going through this same process of rural evolution, and that the farmers abroad are purchasing pleasure as well as specially designed vehicles intended for the transportation of crops to the railroads and cities. This innovation will bring about great changes in the business life of the farmer. His truck wagons with vegetables and farm produce will run to the cities from considerable distances, and a vast area around each great center of population will be tributary directly to its central markets. Besides, the farmer who can reach his neighbor ten miles distant in half an hour will no longer complain of isolation. The mails can be delivered over extended areas from house to house, and finally, the automobile has already become a potent factor in furthering the construction and maintenance of good roads, for which the city and country folk alike are so zealously working.

In regard to the momentous question of economy in good roads "The Scientific American" gathers the following from the report of the Maryland Geological Survey for 1899:

"As the result of a careful estimate made by the survey, it is shown that the farmers of the state of Maryland expend $3,000,000 a year more on their hauling over the present poorly built highways than would be necessary if the hauling were done on first-class roads. These figures are to be compared with the information collected by the Department of Agriculture in 1895, when, as the result of data received from over 1,200 counties in various parts of the United States, it was ascertained that the average cost of hauling one ton for one mile over country roads was 25 cents, which was just three times as much as the average cost of hauling over the improved macadam roads of six European countries. If this large sum of money represents the loss to the state of Maryland from poor roads, it is easy to say that the total loss throughout the whole United States represents a figure so great that it must have an important bearing upon the prosperity of the country at large, and practically upon the farming interests as such."

These are certainly appalling figures, and cannot help but impress the road-building authorities of every state and county with the urgent need and importance of good highways.

### An Innovation in Automobile Housing.

On another page is described and illustrated a method of catering to those who desire to use the automobile for pleasure and shopping purposes which has impressed us as a very novel and commendable one. It is practically the institution of a private automobile livery and boarding house—the word stable being as inappropriate in this connection as the horse would be for this modern apartment house. It is, as explained in the article, the intention of the owner to house the automobiles owned by the tenants, furnish current and charging facilities to those owning electric vehicles, and keep a number of them on tap for the exclusive use of the tenants. The plan is thoroughly up to date, and will, without doubt, prove a big drawing card in obtaining tenants. Furthermore, we are informed by several prominent architects that they are seriously considering the planning of automobile rooms and houses for private residences, and that in the near future ground floor plans of modern dwellings will materially differ from the present ones, due to the advent of the automobile.

During their visit to the Paris Exposition three "great mandarins," governors of three states of Annam, were taken in horseless vehicles to the factory of the Mors Company, at Grenelle, where an opportunity was afforded them of inspecting the details of manufacture of horseless vehicles. The governors were greatly interested, and made some very encouraging remarks with respect to the market which will soon be opened to automobile manufacturers in the Far East.

### The International Automobile Congress.

A Brief Sketch of Its Labors.

In our last issue we printed a provisional programme of the proceedings of the International Automobile Congress, held in Paris from July 9-15. The congress, which has now concluded its labors, was well attended by representative automobilists, and has been voted a great success. Numerous important topics were ably discussed, and below is given a brief resume of the papers and discussions.

M. G. Forrestier, who presided, referred in his opening address to the advisability of having interchangeable parts on vehicles so as to reduce their cost and facilitate repairs. This work of standardization, he said, has already been taken up by the Automobile Club of France. He also expressed the opinion that the limits of speed should be fixed in proportion to the brake power of the vehicle. The presiding officer also read a paper on explosion motors, in which he reminded his audience that calorific losses are due in explosion engines to the same causes as in steam engines, but they are fortunately less, the useful heat efficiency being from 15 to 20 per cent. of the calorific value of the fuel. He further pointed out that electrical ignition, owing to its easy timing, permits of a better control of the power of the motor than does tube ignition. He also advocated a trial of a compressed gas motor, the gas being produced on the Duryea principle. In concluding his paper M. Forrestier expressed the fear that the balancing of motors can only be done with a large increase in bulk and weight. He also expressed regret that calculations are now made for explosion engines according to empirical data, each constructor working on his own experience.

MM. Granville and D'Arguembourg described at length various means of water-cooling motors, the best of which is, in their opinion, the use of a centrifugal pump. Comte de Laubat alluded to the De Laval turbine and to liquid ammonia motors as means of propulsion. M. Petreano spoke of alcohol motors, the greatest objection to which in France seems to be the high price of fuel. He claimed that he had invented a new alcohol motor in which the explosion is instantaneous and without flame, and in which greater economy is secured than when using any form of carbureter in conjunction with an ordinary petrol motor. M. Moreau, in his paper on explosion engines, showed the great disadvantage in the cost of alcohol and advised the use of six-stroke motors.

M. Amedee Bollee, in his paper on steam systems, pointed out the necessity of having reliable feed-pumps and injectors; the former, he said, ought to be of the plunger type, running at about 150 revs. per minute. He also advocated the use of superheated steam, and the superheater should be placed under the grate or near the smoke-box (in the chimney). Comte de

Laubat recommended the adoption by the congress of water tube boilers for heavy steam cars, and the exclusive use of oil engines for light vehicles. This was energetically opposed by Major Howard, an American, who induced the congress to adopt a recommendation to the effect that the relative merits of both systems should be thoroughly investigated. The congress, however, condemned the use of liquid fuels for firing steam boilers.

Major Howard pointed out the vital importance of the use of standard charging connectors as part of a standardizing system, which was not indorsed by MM. Pollak and Krieger.

There were interesting discussions on the question of direct-connected electric motors and the various kinds of windings, but no definite conclusions were reached. M. Jeantaud preferred the method of supporting cells underneath the vehicle in a tray, which lowers the centre of gravity and allows of easy removal of the cells, to fixing them upon the hind axle. He also depreciated the use of tubular frames for vehicles weighing over half a ton. In discussing M. Forrestier's paper on tractive efforts it was claimed that the use of roller or ball bearings has given little satisfaction and not increased the total efficiency when used on heavy cars, as they easily get out of line.

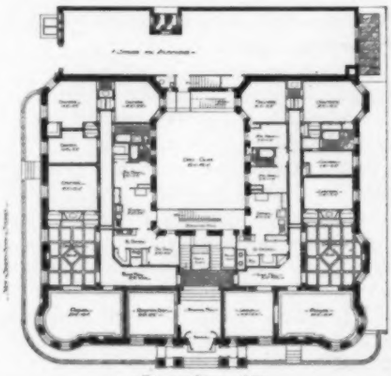
Tires of moderate widths were recommended, the broad ones being troublesome when turning corners, owing to the increased friction on the edges.

The proceedings of the congress will be published very shortly, and will be of great value for discussion at the next international meeting.

## The Automobile House of "The New Century" Apartments.

That the automobile is daily becoming a more and more important factor in the social, as well as the commercial, life of the people is plainly evidenced by the influence it is exerting on nearly every industry and profession. As another example of this we find modern architects and owners of private residences and apartments seriously considering the housing of horseless vehicles. While the general planning of automobile rooms or stables may still be a thing of the distant future, an encouraging beginning has been made in New York City by Mr. William B. Francke, who is building a commodious automobile-house in connection with "The New Century" apartments, which are located at the northwest corner of West End Ave. and 79th St., and are rapidly nearing completion. The automobile house runs along the entire west end of the building, and as shown in the illustrations, is 20 feet in width, is located above the engine and boiler-room, and is two stories in height. On the first floor, on a level with the street, the automobiles will be charged and stored, and the upper floor is intended for living apartments for the automobile attendants and a laundry. There is room on the floor for about twelve automobiles, and the owner of the building proposes to purchase one-half of that number of automobiles, which will constitute a private livery stable for the use of the tenants. The remaining space is reserved for the storage of vehicles owned by the tenants. This innovation will undoubtedly be greatly appreciated by the future occupants of this modern dwelling, the first of its kind in which provision has been made for this "New Century" conveyance.

AUTOMOBILE HOUSE, "NEW CENTURY" APARTMENTS.



GROUND PLAN—"NEW CENTURY" APARTMENTS.

The Electric Vehicle Co., New York, had at the Paris Exposition what was acknowledged to be one of the most complete and elaborate displays of automobiles made. The foreign representative of the company, who was in charge of the exhibit, was, it is stated, a member of the jury, and in consequence a sign "hors concours" accompanied the exhibit, signifying that the company was not competing for honors, considering it a higher honor to be among the jurors.

A new course of study has been added to those now taught in the School of Engineering of Columbia University. It deals with the construction of automobiles, self-propelling road engines and railway cars.

## Automobilism at the Interstate Fair.

As announced in these columns last month, the Greater Interstate Fair, Trenton, N. J., to be held September 24th, 25th, 26th, 27th, and 28th, is to have automobile races and exhibits. Offices of the automobile department have been opened up at Room 60, Astor Court Building, New York City, where information can be obtained.

It is announced that Mr. Geo. F. Chamberlin, acting president of the Automobile Club of America, has accepted, in behalf of his club, the cup which the Trenton Fair Association tendered the Automobile Club of America, to organize a run from New York to Trenton on Sept. 22d. The winner will be presented with the cup. The committee on runs and tours is now organizing the run. It is expected that racing machines will give time allowance to the other automobiles entered.

All floor space originally assigned to the automobile section of the fair, comprising 25,000 square feet, has been taken, and the erection of an annex is in contemplation. The time originally set for the closing entries for the automobile races has been extended to Sept. 20th. Mr. M. R. Margerum is the secretary of the association, to whom applications for entries should be made.

## Tri-State Fair Exhibition.

The Tri-State Fair is to be held at North Hudson Park, Guttenburg, N. J., from Sept. 18th to the 22d. It is announced that one of the leading features will be an automobile exhibition and race meet under the auspices of the Automobile Club of America. On the opening day there will be a grand automobile parade, followed by not less than nine events, for which prizes will be offered.

## The Inter Ocean Exhibition.

The automobile exhibition and race meet to be held under the auspices of the "Inter Ocean" at Washington Park, Chicago, Sept 18th to 22d, give every promise of being most successful. The promoters are confident that the attendance will be very large, and nearly every prominent manufacturer of automobiles will be represented. The prizes offered should make the events interesting and arouse much enthusiasm.

## Madison Square Garden Exhibition.

The chairman of the exhibition committee, Mr. A. R. Shattuck, of the Automobile Club of America, states that all the floor space for the automobile exhibition, which is to be held in Madison Square Garden, New York, November next, from the 3d to the 10th, has been taken by intending exhibitors, and the demand for space has been so great that it has been found necessary to floor over the boxes on the north side of the building, and also make an exhibit of automobiles in the restaurant.

# Club News and Views.

### Club Directory.

Automobile Club of America, Homer W. Hedge, Secy., 120 Broadway, New York; representative to Paris Congress, A. C. Bostwick; representative on International Racing Board, Clarence Grey Dinsmore; substitute, John H. Flagler.

Automobile Club of Baltimore, W. W. Donaldson, Secy., 872 Park Ave., Baltimore.

Chicago Automobile Club, Chas. T. Jeffery, Secy., Chicago, Ill.

Automobile Club of Columbus, C. M. Chittenden, Secy., Broad St., Columbus, O.

Automobile Club of Rochester, Fredk. Sager, Secy., 66 East Ave., Rochester, N. Y.

Buffalo Automobile Club, Geo. S. Metcalf, Secy., Buffalo, N. Y.

Cleveland Automobile Club, L. H. Rogers, Secy., Cleveland, O.

Columbia College Automobile Club, Lewis Iselin, Secy., Col. College, New York.

North Jersey Automobile Club, E. T. Bell, Jr., Secy., Paterson, N. J.

Philadelphia Automobile Club, Frank C. Lewin, Secy., Hotel Flanders, Phila., Pa.

Pennsylvania Automobile Club, Henry J. Johnson, Secy., Philadelphia, Pa.

San Francisco Automobile Club, B. L. Ryder, Secy., San Francisco, Cal.

Worcester Automobile Club, Harry F. Knight, Secy. and Treas., Worcester, Mass.

### The Year Book of the Automobile Club of America.

The year book, or automobile manual, issued by the Automobile Club of America has made its appearance, and has been received with much gratification by the members. It is a very creditable and valuable publication of local and international importance. It contains, besides facts of interest in regard to the club itself, a list of the members, charging and repair stations throughout the country, the custom regulations in this and foreign countries, a list of the officers and headquarters of the divisions of the League of American Wheelmen, a list of valuable maps, a list of automobile clubs in the various countries, road ordinances in vogue in the principal American cities, a legal opinion rendered by Judge Sutherland in regard to automobiles, a number of handy formulae and tables and blanks forms of an automobile log. The book is handsomely bound in leather, contains 135 pages, and is well indexed.

### The Worcester Automobile Club.

The Worcester Automobile Club has been organized in Worcester, Mass. It is the first club of the kind in Massachusetts, and its initial membership is composed of some of the best known people in the city. A very considerable increase of members is assured. The following are the officers: President, James E. Farwell; vice-president, James W. Bigelow; secretary and treasurer, Harry F. Knight; chief marshal, W. A. Sutton.

### Pennsylvania Automobile Club.

The Pennsylvania Automobile Club was organized last month at 53 N. Broad St. Philadelphia. The organization was first known as the Locomobile Club, but as many of its members were owners of gasoline machines, it was deemed advisable to change the name. The following officers were elected: President, Dr. F. L. Sweany; vice-president, Julian Haugwitz; secretary, Henry J. Johnson; treasurer, Charles E. Wright; captain of runs, S. Leon Gans.

### Foreign Automobile Club Emblems.

We illustrate on this page a number of emblems adopted by foreign automobile clubs which may be of interest to our club readers in view of the recent adoption of an emblem by the Automobile Club of America. The first design is that adopted by the Automobile Club of France, the second the emblem of the Dordogne A. C., which for some unaccountable reason presents a picture of a bicycle; the third the emblem of the Normandie Club, the fourth the artistic badge of the German Club, the fifth that of the Belgian Society, the sixth has been adopted by the Italian Club, the seventh by the Automobile Club of Nice, the eighth by the A. C. of Great Britain, which does honor to the early steam vehicle, and the ninth shows the unassuming badge of the Automobile Club of Switzerland.

FOREIGN AUTOMOBILE CLUB EMBLEMS.

### The Touring Club's Pavilion at the Paris Exposition.

The "Touring Club," of France, in order to promote good-fellowship among automobilists, and to establish a home for visiting members of clubs, has thrown open its beautiful pavilion erected on the Exposition grounds and shown in the accompanying illustration. All charts, maps and records have been transferred from their home at 10 Place de la Bourse to the temporary headquarters and an information bureau, in charge of an interpreter, has been instituted. This courtesy is greatly appreciated by visiting automobilists who have found this bureau of great assistance to them in the planning of trips. We are indebted to "La France Automobile" for the illustration.

THE TOURING CLUB'S EXPOSITION PAVILION.

### Association of Motor Cyclists.

A meeting of motor cyclists was held in Boston August 22 and a permanent organization effected, known as the Associated American Motor Cyclists. The following officers were elected: President, C. H. Metz, Waltham; vice-president, Kenneth A. Skinner, Boston; secretary, S. W. Merrihew, Boston; treasurer, C. E. Stearns, Syracuse. The executive committee consists of the officers of the association and five members at large, as follows: A. L. Adams, Connecticut; Edward Hayes, Rhode Island; A. L. Banker, Pennsylvania; F. L. Clark, Maryland, and George K. Barrett.

The Automobile Club of Great Britain and Ireland has now a registered membership of 700.

It is reported that when the Prince of Wales arrived at Wilhelmshohe, Germany, Emperor William, possibly by way of compliment to the Prince, was waiting at the railway station in an automobile which had been sent to him by the war office as a model.

## Correspondence.

Space will be given on this page to letters concerning the Automobile, its operation or construction, to accounts of tours or runs, routes of travel, good roads, etc. When requested by correspondents their names will not be published, but must always be given in the communication to the Editor.

### Answers to Inquiries.

In reply to the question as to:

"*The danger of side slip with motor bicycles on which the motor is mounted above the wheels*," which appeared in the July number of THE AUTOMOBILE, the following additional letters have been received:

The Anthony Motor and Manufacturing Co., Colorado Springs, Colo., write:

"Referring to a communication in your August issue, relative to the mounting of motocycle motors, and signed by the Cycle and Tool Mfg. Co. of Springfield, Mass., we would like to state that the rider having a bundle strapped to the handle bar, as they suggest, would notice a vast difference between conditions existing if the bundle were strapped to the wheel tightly, allowing no swing or motion independent of the wheel, or if this same bundle were allowed more or less play. In the former case no trouble would be experienced by a good rider, and we find this to be the case in every-day use of our bicycle motors, which are rigidly fastened to the steering wheel portion of the bicycle. We mount motors in the frame also, but for an attachable motive power designed to avoid any change whatever in wheel construction, we believe the former method possesses many advantages."

In reference to this question the "Banker Bros. Cycle Co.," Pittsburgh, Pa., write as follows:

"We have been experimenting a great deal with motor cycles, tricycles and quadricycles. The first named machine we have been using is of the Werner Bros.' manufacture, which is made in France. These machines are nicely made, and the engine develops 1¼ horse-power. It is mounted on the head of the machine, the power being transmitted to the front wheel by a belt. We have found this an elegant way of transmitting the power, especially on a bicycle, for the reason that it simplifies the construction to a certain extent. We also think that placing the motor over the crank axle is a very good place for it. It is certainly dangerous to ride a motor cycle on a very wet pavement, on account of side slip. There is not much danger of side slip only in making sharp turns or crossing street car rails. The bicycle has certainly a great many advantages over the tricycle, for the reason that it can be taken in any width of door, and can also be used on a side path. When it comes down to the tricycle, it certainly has its advantages, for the reason that it is almost impossible to tip it over, and is not as dangerous on wet pavements; and, another thing, you can go through muddy roads with a tricycle where it would be impossible to use a motor bicycle. The Werner machines steer very easily with hands off, and a person can ride for miles without putting hands on the bars. The idea of some people mounting a motor directly above the rear wheel is certainly a very poor one, as we believe putting a motor in this position it will get very little air. A motor in this position might run all right for a couple of miles, until it got hot, and then it would not run again without sufficient cooling."

The following reply has been received from the Steffey Manufacturing Co., Philadelphia, Pa.:

"As we have done a good deal of experimental work in this direction we know that a motor mounted above the wheel, especially above the front wheel, in which case it would be secured to the front fork and handle-bar, would make the steering very difficult, particularly in turning. Any rider who has ever carried a weight of twenty pounds or more secured to the handle-bar realizes this, and using the front wheel as the propelling wheel, also increases the tendency to slide.

With our motor located as it is centrally between the wheels, with the weight low down near the crank hanger, there is no disagreeable effect produced on the steering. In fact this is the only place upon a bicycle that a motor can be located and give good results. It is well protected here from damage in case of a fall, and there is no danger of the rider being burned by a hot motor when falling from his wheel, as when the motor is placed in front of the handle-bar.

"Those motors which drive by friction on the tire also have the disadvantage of a considerable amount of wear on tire, particularly where the road is damp and the wheel picks up sand, forming a grinding material, which, when it comes in contact with the small roller quickly, cuts away the tire.

"Some makers have attempted to put the motor low down, and have discarded the cranks, but a motor bicycle so constructed is difficult to mount and start, and in case the motor should become disabled, the rider would have to dismount and walk.

"Other inventors have mounted the motors on one side of the rear wheel, but this gives the wheel a clumsy and unsightly appearance, and makes the motor more or less liable to damage by falls. Others have mounted their motor back of the rear wheel, but this, besides being unsightly, throws the entire weight of the motor on the rear wheel."

### To Contest the Selden Patent.

On August 2 an association of gasoline motor manufacturers was formed at the Hotel Iroquois, Buffalo, for the purpose of contesting the patent known as the Selden patent, owned by the Electric Vehicle Co., New York. The officers of the association are as follows: President, Elmer Apperson, of the Haynes-Apperson Co., Kokomo, Ind.; secretary, George P. Brown, of the Winton Motor Carriage Co., Cleveland, Ohio; treasurer, John F. Harper, treasurer of the Colonial National aBnk, Cleveland, Ohio; executive committee, E. B. Gallagher, of the Keystone Motor Co., Philadelphia, Pa.; H. M. Sternburgh, of the Duryea Power Co., Reading, Pa.; A. Snyder, of the Buffalo Gasoline Motor Co., Buffalo, N. Y.; John S. Clarke, of the Autocar Company, Ardmore, Pa.; and the president, secretary and treasurer.

The members of the association entered into an agreement to bear a pro rata share of the expenses of the suit recently brought against the Winton Motor Carriage Co. and the Buffalo Gasoline Motor Co. by the Electric Vehicle Co.

### The Keystone Autocycle.

The Keystone Motor Co. has just brought out the three-seated autocycle shown in the illustration. It is the third type of vehicle placed upon the market by the company, and is practically the standard autocycle elongated 16 inches, with the addition of a seat placed over the motor for the operator. The frame is made of 1½-in. steel tubing 3-16-in. thick. The wheels are 30 and 34 ins. diameter, with 2½-in. pneumatic tires. The spokes are 3-16-in. wire-laced tangent. The rear axle is 1⅝ ins. diameter and is carried in self-adjusting bearings. The front axle has a slight movement around a king bolt in the vertical plane to compensate for the irregularities in the road, thus obviating the danger of twisting or distorting the frame.

The motor is a standard Keystone gasoline 4 by 4 engine and will deliver two actual horse-power at 400 revolutions per minute and four horse-power at 800 revolutions. It is controlled from the driver's seat and can be speeded as desired by simply operating a small lever. The clutch and back gear mechanism are also controlled from this seat. Two changes of gear are provided. The gear having a ratio of 5 to 1 gives a maximum speed on good roads of 20 miles an hour, while the hill climbing gear gives a maximum speed of 6 miles an hour. By manipulating, however, the spark advancing lever the engine may be speeded or slowed down at will and a complete range of speed obtained. The water used to cool the engine cylinder is carried in a four-gallon copper tank and in addition a heat radiator is provided. Water enough is carried for a ten hours' run. Common stove gasoline is used for fuel and it is claimed that two gallons of gasoline is sufficient to travel 100 miles over good roads at a total cost of 20 to 22 cents.

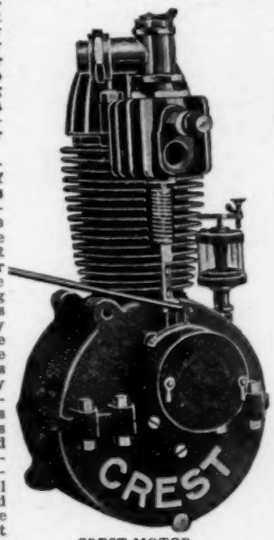
KEYSTONE AUTOCYCLE.

# New Appliances.

## THE "CREST" DUPLEX MOTORS FOR TRICYCLES AND VOITURETTES.

From the construction of a high-grade bicycle to that of a motor cycle is but a small step which the small bicycle manufacturer has not been slow in realizing, especially as his shop equipment need not be altered nor enlarged materially as long as he can purchase a motor or engine from a reliable concern which will suit his home-made frame. This demand has induced the Crest Manufacturing Co., of Cambridgeport, Mass., to build a new type of single-cylinder motor of three horse-power, which is particularly adopted for tricycles and light voiturettes, and is illustrated below.

They propose to furnish free with every motor purchased from them a complete set of full-size working drawings of one of the latest types of French motor tricycles, so that it will be an easy matter for any bicycle concern or repair shop, who has a brazing outfit, to make a few motor tricycles for their trade.




CREST MOTOR.

One of the special advantages of the new motor is that all the working parts can be removed from the motor without taking the motor from the tricycle or disconnecting pipes. This is done by simply taking off the lower part of the crank case. This is an exceedingly important advantage, as it allows for quick repairs on the road, and will be appreciated by all automobilists. It will also be noticed that they have increased the heat radiating surface as compared with other types of motors, insuring a cool motor under the most extreme conditions of service.

These motors are from five to eight millimeters larger in diameter than all other types of air-cooled motors. An important peculiarity of the sparking device is that the motor has to be always started on the slow speed. This improvement is used on this motor only, eliminating all danger of breaking chains or gears.

One of the patented features, attached to their sparking device, is the exhaust valve lifter, by which the relief valve on the cylinder head is dispensed with for starting the motor, making the motor noiseless in going by animals, and also saving the gasoline.

The handling of the motor has been extremely simplified. The numerous handle rods are dispensed with, the manipulation of the motor being done with one handle. This one handle first closes the exhaust, then switches in the current, and gives every change of speed from the lowest to the fastest.

A new device peculiar to their motors is the swivel elbow, which can be moved in any direction to suit the pipe connections. The elbow contains the gauges for perfecting the mixture, and also prevents back explosions, as the explosion takes place to the atmosphere.

They use on their motor the Crest indestructible sparking plug, which is now largely used by larger numbers of gas engine manufacturers in this country. The motor is furnished complete with carburetor, coil battery and muffler, with set of drawings for a motor tricycle. The weight of the motor is 69 pounds, and is claimed to be the lightest single-cylinder motor per horse-power made. Every part of the motor is built to gage, insuring interchangeability of parts.

## AN INTERESTING RUN.

In company with Mr. Andrew Binker and Mr. F. H. Ball, Mr. C. J. Field, vice-president and general manager of the De Dion-Bouton Motorette Co., Brooklyn, took a trip down on Long Island recently in one of his motorettes. The record made was a very creditable one. A considerable portion of the roads was found to be very dusty, owing to the fact that there had been practically no rain for two months. The average time of the vehicle was over fifteen miles per hour and was maintained throughout the trip, except for about ten miles in crossing the Island from East Cove to River Head, where, owing to the deep sand, much slower time was made. The route followed was down the Merrick Road on the south side as far as East Cove, a distance of about eighty-five miles and from there across to the north side to River Head, and from there along the north shore to Greenport. The total distance of the route travelled was about one hundred and twenty miles. This certainly seems a very good run for so small a vehicle with three persons on board, as well as a large amount of baggage, and gasoline sufficient for the entire trip.

## CONRAD MOTOR CARRIAGE COMPANY'S SPECIALTIES.

The Conrad Motor Carriage Co., Buffalo, N. Y., has given special attention to perfecting a gear for automobile service. The gear has forgings of Norway iron and steel, tool steel back axle, roller bearings, and is so constructed as to enable the front wheel to pass over obstructions without straining any portion of the running part. The springs are of Swedish steel, oil tempered. The reaches are of steel tubing. The company furnishes any style of body on this gear. The aim has been to produce a gear especially for rough roads and at the same time have it light and thoroughly practical. The company also manufactures differentials, back axles, steering devices, bodies, etc., and furnishes wheels with either solid or pneumatic rubber tires as preferred.

FIG. 1—CONRAD MOTOR CARRIAGE COMPANY'S SPECIALTIES.

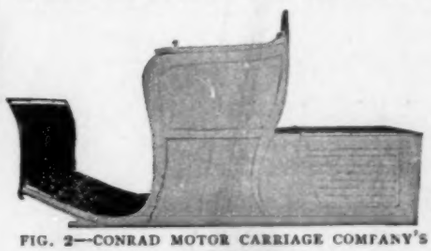


FIG. 2—CONRAD MOTOR CARRIAGE COMPANY'S SPECIALTIES.

## AUTOMOBILE BELLS.

In the accompanying engravings are shown two styles of automobile bells recently brought out by the Frank Mossberg Co., Attleboro, Mass.

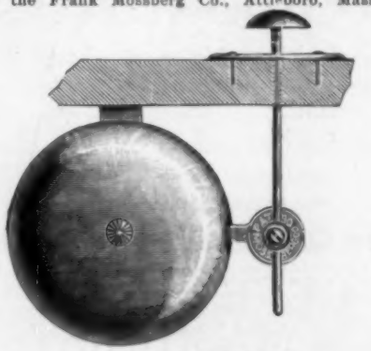


FIG. 1—AUTOMOBILE BELLS.

Fig. 1 shows a 2½-inch gong especially adapted to small automobiles and its manufacturers claim that for its size it has an exceptionally loud and clear tone. Fig. 2 shows a 5-inch gong made of pure bell metal and its loud, clear tone especially recommends it for crowded thoroughfares and is suitable for omnibuses, delivery wagons, etc.

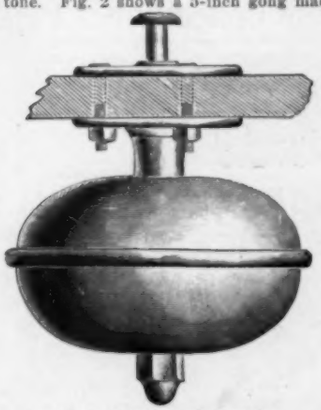


FIG. 2—AUTOMOBILE BELLS.

The Thomson-Houston Electric Company and E. H. Levis are joint plaintiffs in a suit brought in Cleveland against the Lorain Wheel Company, charging the Lorain Co. with manufacturing and selling electrically propelled vehicles covered by the patent granted Rudolph M. Hunter.

There may be other self-propelled vehicles which meet your demand for an ideal automobile, but we would like the privilege of writing you how and why this particular one gives all pleasure and no annoyance—before you make a purchase.

MAY WE?

PRICES
With top, $1000
Without, 925

Waltham Mfg. Co.
Waltham, Mass.

Bicycles,
Motor Bicycles,
Autogos, Automobiles.

# Portable Rheostats

which enable you to charge your storage batteries from any Edison station or trolley station, while touring.

Also equipments for private stables and for charging stables.

**Iron Clad Resistance Co.,** Westfield, N. J.


## SPECIAL NOTICES.

**Cards "Wanted" and "For Sale," inserted under this heading at two cents per word agate measure. Minimum price, fifty cents.**

FOR SALE.—Waverley electric four-passenger vehicle, $900; locomobile (steam) two passenger, $600; almost new; both in fine condition. C. O. REICHERT, New Haven, Conn.

WANTED.—Second-hand Automobile to seat four; gasoline or steam; must be in good order and all right. "H. P. E.," care THE AUTOMOBILE, 150 Nassau St., New York.

OWNER buying four-passenger Winton, will sell for $975 his new 1900 Standard two-passenger Winton Phaeton, latest model, perfect order. Superior engine. Is very fast. Has been used four weeks. Can be seen in New York and fully tested by purchaser. Address R. E. M., The Automobile, New York.

WANTED to buy, second-hand automobile; must be in good condition and cheap for cash. Address AUTO, care of The Automobile, New York.

WANTED position as foreman by man experienced in building electric automobiles, New York. Address MACHINIST, care of The Automobile, New York.

FOR SALE.—Locomobile, 1900 Stanhope model; in perfect condition; only run about 275 miles; will be sold at liberal discount if sold quickly as cash is needed. Address "LOCO," care The Automobile, 150 Nassau St., New York.

POSITION WANTED.—Young man, ambitious to enter, learn and follow the automobile business, desires position where this is possible; now studying electrical course. Address "J. P. D.," care of The Automobile, 150 Nassau St., New York.

A BICYCLE FIRM of established reputation, whose factory is situated near New York City, is desirous of making a connection with some company who wish to build automobiles. Address in confidence, "INQUIRER," care THE AUTOMOBILE, 150 Nassau St., New York.

WANTED—To buy two first-class high-grade automobile landaus on monthly installment plan for public use in southern city of eighty thousand with no automobiles; have good livery and carriage business established; would also like local agency for good company. Address Progress, care The Automobile, 150 Nassau St., New York.


# GENERAL MACHINISTS AND

**Special Machinery**
**Experimental Work**
**Hydraulic Machinery**

AUTOMOBILE WORK A SPECIALTY

HYDRAULIC FORGING IN IRON AND STEEL

**The United States Projectile Co.,** 1st Ave. & 53d Street, **Brooklyn, N. Y.**

We hereby offer our $5.00 8-cell Automobile Gasoline Engine Battery at $4.00 cash, with order. Carriage lig t 9 cell battery, price $5 50 for $4 50 for thirty days, to show you what these cells will do Our Campaign Button without picture is worth as a portable light, $3 00; we offer it now at $1.50, mail prepaid

**WILLIAM ROCHE,** Inventor and Sole Manufacturer, **42a Vesey St, New York.**

# AMERICAN PATENT AUTOMOBILE GAUGES

**AND POP SAFETY VALVES**

These gauges are made especially for automobile use. They have been adopted by the leading Automobile Manufacturers throughout the United States and Foreign countries

**Simple Accurate Durable**

ABSOLUTELY GUARANTEED

**Manufactured exclusively by**

**American Steam Gauge Company**

New York BOSTON Chicago

SINGLE STYLE DUPLEX STYLE

# THE LIFE OF AN AUTOMOBILE.

The easy working of the parts and the comfort of the driver

**Largely Depends Upon Perfect Lubrication.**

**Dixon's Pure Flake Graphite** Is the only lubricant that can withstand the heat in a gas-engine cylinder. Pure flake graphite perfectly lubricates motor cylinders and all working parts. We prepare Special Lubricants for Gears of Electric Motors and Special Lubricants for Chains of Motor Vehicles. *Correspondence solicited.* Samples free to responsible parties.

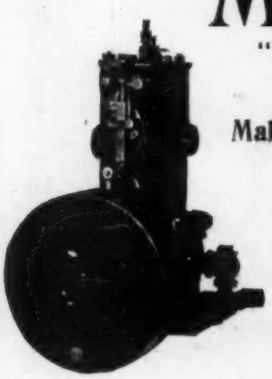
**JOSEPH DIXON CRUCIBLE CO., JERSEY CITY, N. J.**

# "MOBILE"

**"WESTCHESTER MODEL"**

**Immediate Deliveries**

**Maltby Automobile and Motor Co.**



Manufacturers of Gasolene Motors for Automobiles and Launches.

**10 Clinton Street, Brooklyn, N. Y.**

**AUTOMOBILES STORED and REPAIRED**


## Personal.

Mr. E. E. Schwarzkopf has tendered his resignation as editor of the "Automobile Magazine" to Mr. De Borden Wilmot, receiver of the United States Industrial Publishing Co., publishers of the "Automobile Magazine."

## Trade News.

A very attractive catalogue has recently been issued by the Keystone Motor Company, Philadelphia, Pa., in which are set forth the advantages of the Keystone autocycles and motors, the various types being fully described and illustrated.

The Peerless Long Distance Steam Carriage Co., Washington, D. C., is preparing to build automobiles of all kinds, special types being made to order. The engines used will be of the torpedo boat type. The company also proposes to make running gears and furnish supplies.

The Safety Steam Automobile Co., 100 Blackstone St., Boston, announces that it is now building its first carriage, which it expects soon to have completed. The patent under which the company will operate has just been allowed and covers the making and use of steam without accumulated pressure.

"Some Words of Wisdom About Paint" is the title of a little pamphlet recently issued by the Joseph Dixon Crucible Co., Jersey City, N. J. In its pages is contained among others things information as to what constitutes the best paint, a definition of graphite, and a general dissertation on the advantages of graphite paint.

The Anthony Motor and Manufacturing Co., Colorado Springs, Colorado, sends us its catalogue, giving a very complete description of its motor and line of motor cycles. The company furnishes either the motor cycle complete or the motor alone, which, it is claimed, can be attached to an ordinary diamond-frame bicycle.

The Overman Automobile Co. has its main office at 81 Fulton St., New York City, and its factory at Chicopee, Mass. The company announces that it will soon be in shape to furnish steam automobiles, as the factory is now in operation. The company styles its automobile the "Victor," a description of which has already appeared in these columns.

The Maryland Automobile Mfg. Co., Cumberland, Md., has just issued a very neat catalogue descriptive of its product. The vehicles manufactured by this company are steam, and several points of excellence are claimed by the manufacturers. The line of vehicles manufactured includes runabouts, tourists carriages, delivery wagons, also coaches and large passenger wagons.

The Baldwin Automobile Mfg. Co., Connellsville, Pa., has just issued a very neat catalogue descriptive of its various styles and types of automobiles. It is in colors with a rich cover and is printed on good paper. Altogether it contains much information for those contemplating the purchase of an automobile, whether it be a stanhope, runabout, a delivery, a trap, or a surrey.

The De Dion Bouton Motorette Co., Brooklyn, reports an astonishing number of inquiries for its motors, motorettes and parts. In the records of tours and races abroad, especially the thousand-mile run in England for motorettes or voiturettes and quadricycles and tricycles, also records in pacing and track races in this country, it is shown that the De Dion motor is at the front on all occasions. It is a machine uniformly used by indepedent racing and pacing men, among the latter being Messrs. Kenneth A. Skinner, Jimmy Michaels, C. G. Ridgeway, Miller, Headstrong, Henshaw and others.

The Remington Automobile & Motor Co. has been incorporated under the laws of New Jersey, with a capital stock of $250,000. Its place of business in New York State will be Ilion, where it is proposed to operate a large manufacturing establishment, employing from 200 to 300 men. The motor which the company will manufacture is a new type of piston gasoline motor, the invention of Wm. A. Schmidt, formerly in charge of the experimental department of the Remington Arms Co. The officers of the company are Philo E. Remington, president; S. C. Burch, treasurer; P. A. Stubblebein, secretary.

The Automobile Storage & Repair Co., 57 W 66th St., New York City, finds that the rapid extension of its business has made it necessary to enlarge its present station and provide not only increased floor space, but better accommodations for automobiles. On Oct. 1st it will increase its floor space to accommodate 75 vehicles. A complete plant for more rapidly washing vehicles has been set up and an electric air compressor has been installed for the inflation of tires and other purposes. The company also has special facilities for the purchase, sale, and exchange of automobiles of all kinds. A new building in Brooklyn at the corner of Flatbush Ave and Dean St., is at present under construction, which the company expects to open about Oct. 1st.

Dr. R. V. Pierce and Dr. V. Mott Pierce, Buffalo, N. Y., recently commenced building heavy delivery wagons designed especially for newspaper delivery work. On another page is given a description of this delivery wagon. Among the orders received by the proprietors are such metropolitan papers as New York "Journal," Pittsburg "Chronicle-Telegraph," New York "Sun," New York "Mail and Express," Buffalo "Times," "Times-Union," Albany; St. Louis "Star," Kansas City "Journal," Chicago "Home Journal," Times Newspaper Co., Minneapolis; "Inter-Ocean," Chicago; "The Sentinel," Indianapolis; Albany "Journal," Milwaukee "Journal," "The Omaha News," "The Home Talk," New York; "Daily Telegraph," Philadelphia; "Nebraska State Journal," "The Philadelphia Times," Baltimore "American," and "The Topeka Capital."

## New Publications.

The Motor Vehicle Industry is the title of a pamphlet published by Mr. W. A. Whittlesey of Boston, Mass. It is a compilation of the history of the automobile industry as told in the American periodicals. This compilation is the result of an investigation of the automobile industry undertaken by Mr. Whittlesey at the request of several Boston gentlemen. The growth, motive powers, expense of operation compared with previous forms, legislation and patents are some of the phases of the subject to be found in this work.

The National Newspaper Directory & Gazetteer, issued annually by the well-known advertising agency, Pettingill & Co., Boston and New York, is just out for 1900. The book contains over 1,000 pages and is a complete classified directory of the newspapers and periodicals published in the United States and gives the name, frequency of issue, class, year established, subscription price, and circulation of each. Colored maps of each state and territory are also given. A comprehensive description of over 8,500 of the leading cities and towns is given, embracing much valuable information as to the size, leading industries, etc., of each. The book is well printed on good paper and presents a handsome appearance. The price is $5 a copy.

## Patents.

**List of Automobile patents granted during month of August.**

654,742—Automobile Truck. Issued to H. W. Libbey.
654,996—Gasoline Motor. Issued to S. Messerer.
654,634—Automatic Pump for Pneumatic Tired Wheels. Issued to H. H. Henning.
655,049, 655,050—Cushion Tire. Issued to O. P. Brown.
655,098—Cushion Tire. Issued to O. L. Leach.
654,900—Forming Pneumatic Tires. Issued to G. Knadler.
654,716—Motor Vehicle. Issued to E. P. Cowles.
654,797—Motor Vehicle. Issued to H. J. Lawson.
654,741—Motor Vehicle. Issued to R. W. Libbey.
655,654—Automobile Air Brake. Issued to I. L. Hammond.
655,320—Autotruck for Garbage, Ashes, etc. Issued to J. C. Anderson.
655,563—Electric Carriage. Issued to C. A. Lindstrom.
655,191—Means for Securing Rubber Tires to Vehicle Wheels. Issued to R. A. Brine.
655,321—Autotruck vehicle. Issued to J. C. Anderson.
655,329—Motor Vehicle. Issued to J. T. Dougine.
655,670—Vehicle Motor Frame Attachment. Issued to L. E. Brookes.
655,660—Vehicle steering mechanism. Issued to G. L. Reenstierna.
655,380—Safety device for electric vehicles. Issued to F. E. Case.
655,702—Automobile. Issued to F. G. Frankenberg.
655,749—Power Mechanism for Automobile Vehicles. Issued to Allyne & Pomeroy.


# The Marlboro Automobile & Carriage Co.

is now ready to deliver its steam vehicles in thirty days from receipt of order. These carriages will seat two or four persons. They are honestly built and are equal to, if not better, than any on the market. We can also furnish any and all parts.

**THE ENGINE**—One of the best; weight, about 50 lbs.; develops up to 6 h.p.; simple, double acting, of our own special design; occupies but 4 x 10 inches space; every part interchangeable; so suspended as to keep the driving chain always under the same tension; can be taken out and replaced in five minutes.

**THE BOILER**—Also of our own pattern, is furnished in any diameter desired.

**Running Gears, Steering Devices, Bodies, Ironed and Finished or in the Rough.**

FOR PARTICULARS, CUTS, PRICES, ETC., WRITE

**The Marlboro Automobile & Carriage Co., Marlboro, Mass.**

The durability of HARTFORD TIRES is not a matter of guess-work.

The rubber used in their manufacture is entirely free from heavy mineral substances which tend to harden tires, and lessen their durability.

The fabric is woven from Sea Island Cotton, which is known to be the very best for the purpose.

The tires are made by skilled workmen, and from a process that has never been equalled, although often imitated.

Whether used on bicycles, automobiles, or other vehicles, HARTFORD TIRES are more resilient, buoyant, and durable than any other tire on the market,

## THE HARTFORD RUBBER WORKS CO.

HARTFORD, CONN.

Branches (thoroughly equipped for skillful repair work) at

Boston, New York, Philadelphia,
Washington, Buffalo, Detroit Cleveland,
Minneapolis, Chicago, Denver.

# Automobile Patents Exploitation Company

**Undertakes:**—The manufacture of Automobiles and Motor-Cycles.
The examination of Automobile patents.
To enlist capital for the development of inventions.

**Furnishes:**—Specialists to make thorough examinations of patents.
Experts to test motors and automobiles.
Opportunities to inventors to present properly their propositions to concerns willing to consider and to undertake the same.

**Purchases:**—All meritorious patents, licenses and inventions relating to motor-cycles, motors, gears, automobiles and their parts.

F. B. HYDE, Secretary.

Automobile Patents Exploitation Company,
27 William Street, New York, N. Y.

"Bevin" **Automobile Bell** Two Sizes 3 and 5 in.

Unique in Construction. Most Pleasing in Tone. Easily Attached to Any Vehicle. Insist on Having the Right Thing.

FOR SALE BY ALL DEALERS.

For Sale by
Hartley & Graham
313 Broadway
New York City

Bevin Bros. Manufacturing Co.
East Hampton, Conn.



HALL'S **LOCOBILE**

Conditions found in Steam and Gasoline Carriages
**Cylinders are small**
**High Piston speed.**
**High temperature in cylinders**

They need
**An Oil of high fire test**
**An Oil that will retain its viscosity at high temperature**
**An Oil that will not decompose with heat**
**An Oil free from acid**

**Sold in any Quantity**

"Locobile" will do the work under these conditions

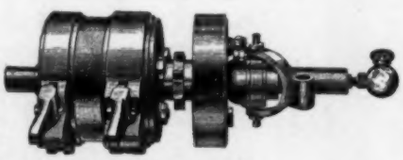
G. E. HALL, 211 Centre Street, New York



UPTON TRANSMISSION **GEAR**

WHAT gear are you using or propose to use in your automobile? The selection of a gear is as important as the carriage itself. A good gear is indispensable. The best will save you much worry and expense and give your vehicle the proper speed. There are many gears, but there is only one perfect gear made

**The Upton Gear**



is a compact, neat, strong, powerful and efficient gear for any kind of gasoline, steam or electric motor vehicles. It is the only gear that is

**Absolutely Dust Proof**

It has two speeds and reverse. No shocks. Change of speed by brakes. Speed ratio may be arranged at will.

Examine, test it and you'll have no other gear but the Upton.

Two sizes: **No. 1, 4 to 5 HP., 35 lbs.** **No. 2, 7 to 8 HP., 43 lbs.**

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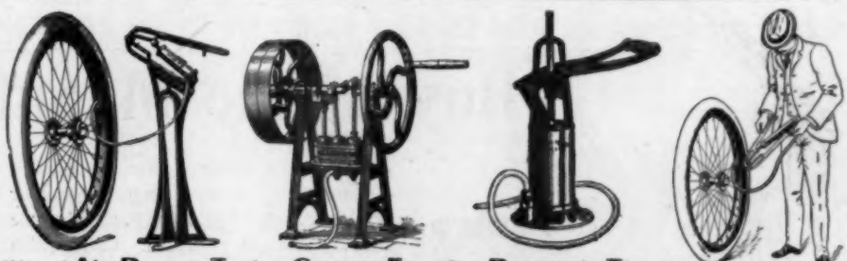

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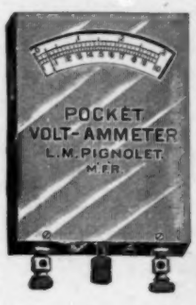


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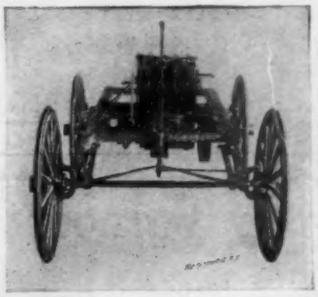

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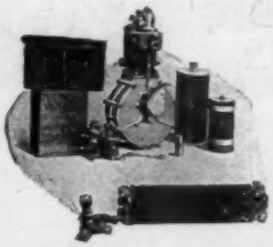

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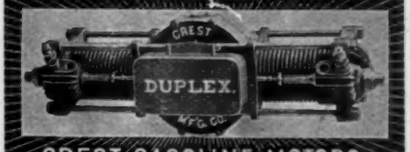


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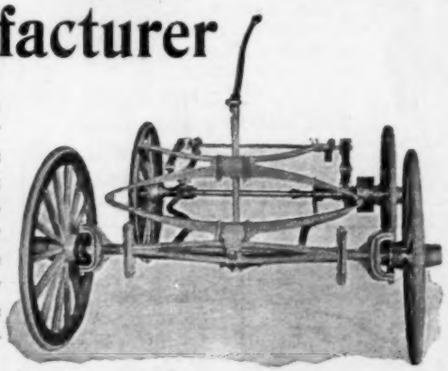

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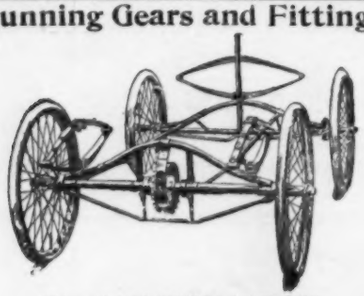

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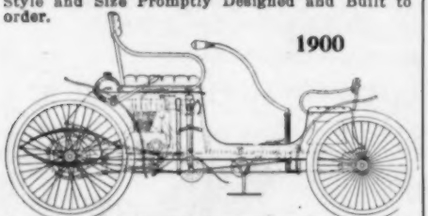

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